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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,970	01/18/2002	Bruce A. Gnade	4380.000300/KDG	1567
23720 7590 03/30/2007 WILLIAMS, MORGAN & AMERSON 10333 RICHMOND, SUITE 1100 HOUSTON, TX 77042			EXAMINER MAYEKAR, KISHOR	
			ART UNIT 1753	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/30/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	Application No.	Applicant(s)	
	10/051,970	GNADE ET AL.	
	Examiner	Art Unit	
	Kishor Mayekar	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-65 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 61-65 is/are allowed.
- 6) ☒ Claim(s) 11-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7 March 2007 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 11-60 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The above claims recite the step of reacting at least one radical

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species by exposure to at least one of a chemical toxin and a biological toxin, or the step of dissociating or ionizing at least one of a chemical toxin and a biological toxin exposed to at least one of the high electric field and the high electron flux (emphasis added). The specification as disclosed in lines 15-20 of page 2 has the support for toxic chemicals used in the production of ammonia, chlorine and insecticide but no support for a chemical toxin. There is a difference between "a toxic chemical" and "a chemical toxin". Since Applicant has asserted in the paper filed 13 February 2007 that a toxin, according to The Merriam Webster Online Dictionary, is "a poisonous substance that is a specific product of the metabolic activities of a living organism and is usually very unstable, notably toxic when introduced into the tissues, and is typically capable of inducing antibody formation", and since the specification as originally filed does not provide the support for the subject matter "chemical toxin" in the meaning defined by the Dictionary, the recitation "a chemical toxin" in the above claims constitutes a new matter.

Claim Rejections - 35 USC § 102 and § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 11, 14, 16, 19, 21, 24, 26, 29, 41, 44, 46 and 49 stand rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious

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over Chalamala et al. ("Effect of CH₄ on the electron emission characteristics of active molybdenum field emitter arrays", J. Vac. Sci. Technol. B 16(6), 1998, pp. 307-376), hereinafter referred as the first Chalamala publication, in light of Chalamala et al. ("Interaction of H₂O with active Spindt-Type molybdenum field emitter arrays", J. Vac. Sci. Technol. B, 17(2), pp. 303-305, 1999), hereinafter referred as the second Chalamala publication, MSDS of Molybdenum (obtained from Alfa Aesar Co., May 30, 2000) and MSDS of Methane (obtained from Airgas Inc, January 3, 2001). The first Chalamala publication, a reference cited by Applicant, discloses a study on the effects of CH₄ on the electron emission characteristics of active field emitter arrays, the study comprises the steps of operating the field emitter array at a low power of 60 V; exposing the field emitter array to at least one gas (CH₄); and forming molybdenum carbides from carbide ions with molybdenum on the field emitter tip (see section Results and Discussion in pages 3074-3075). The first Chalamala publication does not detail the generation of at least one of a high electric field and a high electron flux during the operating step, and the generating at least one radical species as claimed. The second Chalamala publication, a reference cited in previous Office action, shows in another study with H₂O that electron emission from molybdenum field emission arrays is sensitive to the contamination of emission surfaces by residual gases present in a vacuum envelope (abstract and second full paragraph of the left column in page 303), wherein the residual gases in the field emitter arrays include O₂, H₂O, CO₂, N₂, H₂ and hydrocarbons like CH₄ (paragraph crossing left and

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right columns in page 303), and the dissociation and ionization of the residual gases by their interaction with a high electric field and electron flux (the following paragraph in page 303). The second Chalamala publication also discloses, in paragraph crossing left and right columns in page 304 and the following paragraph, an experiment comprising the steps of operating a field emitter array with voltage of 60 V to generate a high electric field and electron flux, exposing the field emitter array to only H₂O residual gas, generating at least one radical species (dissociating or ionizing) from the exposed residual gas to the high electric field and electron flux, and reacting the at least one radical species with the field emitter molybdenum tip (where the molybdenum is considered as a toxic chemical according to its MSDS in section 11 of page 4 obtained from Alfa Aesar Co.). A similarly exists when exposing the field emitter to CH₄ as that to H₂O. As such the first Chalamala publication inherently has the detailed steps. Also CH₄ is the exposed gas and considered as a toxic chemical (according to its MSDS in section 3 of page 2 and by various states in section 15 of page 7 obtained from Airgas Inc.).

The disclosure in the prior art of any value within the claimed range is an anticipation of that range. And where the range overlaps or lies inside the range disclosed by the prior (60 V in operating power), the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the first Chalamala publication's teachings because overlapping ranges have been held to be obvious, *In re Wertheim* 191 USPQ 90.

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6. Claims 11, 14-16, 19 and 20 stand rejected under 35 U.S.C. 102(b) as being clearly anticipated by Chalamala et al. ("Effect of O₂ on the electron emission characteristics of active molybdenum field emission cathode arrays", J. Vac. Sci. Technol. B, 16(5), pp. 2859-2865, 1998), hereinafter referred as the third Chalamala publication. The third Chalamala publication, another reference cited in previous Office action, discloses an experiment comprising the recited steps of operating, exposing and generating (full paragraph in right column of page 2859). The third Chalamala publication also discloses there the step of reacting the at least one radical species with molybdenum tip surfaces of the field emitter array, wherein the metal molybdenum is a toxic chemical.

7. Claims 12, 13, 17, 18, 22, 23, 25, 27, 28, 30-40, 42, 43, 45, 47, 48 and 51-60 stand rejected under 35 U.S.C. 103(a) as being unpatentable over either the first Chalamala publication in light of the second Chalamala publication or third Chalamala publication in view of Applicant's admission. The difference between each of the Chalamala publications is the limitation of the recited process parameter and cathode-to-gate distance. However, Applicant admits in page 7 of the specification that recent advances in field emission arrays to utilize the above limitation. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified each of the above applied reference's teachings as admitted by Applicant

because the selection of any of known equivalent field emitter arrays with the recited limitation would have been within the level of ordinary skill in the art.

Allowable Subject Matter

8. New claims 61-65 are allowed.

9. The following is an examiner's statement of reasons for allowance: Because the prior art references do not disclose in a method the recited step of reacting the at least one radical species with at least one of Sarin, Soman, arsine, germane, diborane, and a toxic chemical used in the production of at least one of ammonia, chlorine and an insecticide in combination with other recited steps as claimed in claims 61-65.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

10. Applicant's arguments filed 13 February 2007 have been fully considered but they are not persuasive.

In response to the Appellant's argument that the three Chalamala publications "are

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not at all concerned with chemical toxins and/or biological toxins and therefore do not describe or suggest reacting, ionizing, or dissociating at least one radical species by exposure to at least one of a chemical toxin and a biological toxin", since hydrocarbon like CH₄ (methane) and metal molybdenum are used or produced in chemical plants and/or manufacturing facilities, the hydrocarbons and molybdenum fitted to the Appellant's disclosure in lines 15-20 of page 2 of the specification as toxic chemicals and further being toxic chemicals according to theirs MSDS, and since each of the Chalamala publications does disclose the limitations related to reacting, ionizing or dissociating a toxic chemical, the rejections stand.

As to the argument that the molybdenum and methane are not a toxin according to their MSDS, the Examiner now contends that they are not each a toxin (i.e., a poisonous chemical of biological origin, produced by a microorganism, plant, or animal) in the meaning as defined by the Dictionary but toxic chemicals. It is known that all chemicals have the potential to be toxic when the dose (or exposure) is large enough to affect the functioning of the organism and since molybdenum and methane are toxic chemicals according to their MSDS, the rejections are maintained.

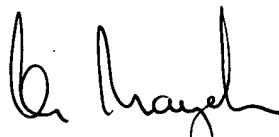
As to the argument that the references fail to teach or suggest any application of a field emitter array to the detection, mitigation, and/or remediation of chemical and/or biological hazards, the limitation on which the Appellant relies is not stated in the claims. Therefore, it is irrelevant whether the references include the limitation or not.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kishor Mayekar whose telephone number is (571) 272-1339. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Kishor Mayekar
Primary Examiner
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